

19/11/2018

Name: Adarsh Prakash Sharma

Roll No: 19/11/2018

Dept: MHS/MBA

Course: CHM 102

### Assignment

1] Give the IUPAC names of the compounds

i]  $\text{HCOOH}$  - Formic acid

ii]  $\text{HOOC(CH}_2\text{)}_4\text{COOH}$  - Pentanedioic acid

iii]  $\text{CH}_3\text{C(CH}_3\text{)}_2\text{COOH}$  - 2-methylpropanoic acid

iv]  $\text{HO}_2\text{C}_2\text{CO}_2\text{H}$  - Succinic acid

v]  $\text{CH}_3\text{CH}_2\text{COOH}$  - Propanoic acid

2] Discuss the physical properties of carboxylic acids under the following headings

i] Physical appearance ii] Boiling point iii] Solubility

- Physical appearance: All simple saturated aliphatic acids up to  $\text{C}_6$  are liquid at room temperature. Most other carboxylic acids are solid at room temperature except for ethanoic acid.

- Boiling point: It increases with increase in molecular mass. Branching decreases the boiling point and hence high melting point.

- Solubility: Lower molecular carboxylic acid up to four carbon atoms are soluble in water. This is due to their ability to form hydrogen bonds with water molecules.

3] Write two industrial properties of carboxylic acids

Green Ethanol

Ethanoic acid is obtained commonly by the liquid phase oxidation of ethanol. The reaction of ethanol to ethanoic acid using oxygen as oxidant and cobalt(II) acetate as catalyst is obtained from ethane.

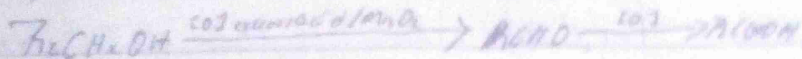


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1. Write equations and brief explanations. Discuss the common properties of carboxylic acid

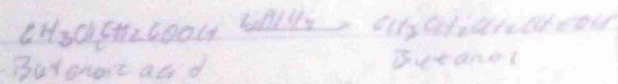
2. Oxidation of primary alcohols and aldehydes

Oxidation of primary alcohols and aldehydes can be used to test for alcohols and aldehydes. Very weak oxidizing agents like  $\text{Cr}_2\text{O}_7^{2-}$  and  $\text{KMnO}_4$  are used.

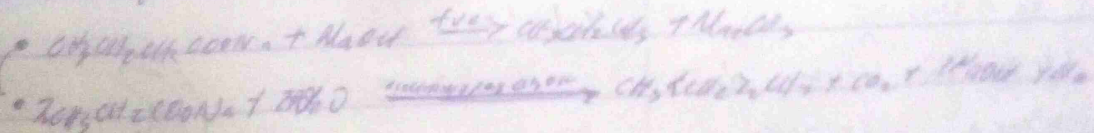


3. Discuss common properties only outline the reduction reactions and acid reactions of carboxylic acid

4. Reduction



5. Decarboxylation



6. Esterification

